

IN THE DRAWINGS

A replacement sheet that includes Figure 4 is attached herewith.

REMARKS

This amendment is responsive to the Office Action mailed January 26, 2005. Claims 3, 4, 6-9, 15, 17, 19, 20 and 25 have been withdrawn from consideration. In response to the Office Action, claims 1 and 16 are canceled and claims 2, 12, 18 are amended to incorporate respective independent claims 1 or 16 from which they depend. Claims 2, 5, 10-14, 18 and 21-24 thus stand rejected and, of those claims, claims 2, 12, 18 are independent.

ELECTION/RESTRICTION

Applicants acknowledge that the Examiner has made the election requirement final.

DRAWINGS

The Examiner objects to figures 4 and 9. Figure 4 is thus amended by the attached replacement page (including figure 4) to show cross-hatching that differentiates between spring element (60) and the gap (64). Reconsideration is requested.

Figure 9 was however not amended. The Examiner states that the item 82 does not "appear" to indicate pins; yet the entire item 82 is indicated by an oval that surrounds all the pins 82 of the figure. If the Examiner continues to feel this is necessary, we can change the figure to indicate each pin 82, although we believe this would be confusing as compared to the present figure 9.

We accordingly ask for reconsideration as to the objection of figure 9.

CLAIM REJECTIONS UNDER 35 U.S.C. § 102

Claims 2, 13, 14, 18 and 23-24 stand rejected under 35 US §102(b) as being anticipated by U.S. Patent No. 4,226,281 granted to Chu (hereinafter, "Chu '281"). We respectfully disagree.

Independent claim 2 provides a thermal transfer interface with the following elements (*with emphasis*):

(A) a thermal spreader forming a plurality of passageways;

- (B) a spring element coupled with the spreader; and
- (C) a plurality of thermally conductive pins for the passageways, each of the pins having a head and a shaft moving with the spring element, at least part of the shaft being internal to the passageway and forming a gap with an internal surface of the passageway, wherein the pin heads collectively and macroscopically conform to an object coupled thereto to transfer heat from the object to the spreader through the passageway gap formed between the spreader and each of the plurality of pins, *wherein the spring element forms a layer with a substantially planar face, each of the pin heads being substantially flush with the face.*

According to the present specification, a spring element that is flush with the face is for example illustrated by middle pin 54 in FIG. 4, illustrating a pin head 54A flush with spring pad 60. See also paragraph [0035].

Chu '281 has no such spring element and thus fails to anticipate claim 2 under 35 U.S.C. §102(b). The Examiner refers to item 36, shown in FIG. 6 of Chu '281; however item 36 is not flush to any head of pin-piston 24. Instead, pin-piston 24 clearly extends through (and is not flush with) material 36.

Claims 13, 14 are amended to depend from claim 2 (and claim 12) and thus benefit from like arguments.

Independent claim 18 provides a method for transferring thermal energy from an object to a heat sink, comprising the following step elements (*with emphasis*):

- (A) biasing a plurality of pins against a surface of the object so that the plurality of pins contact with, and substantially conform to, a macroscopic surface of the object, and
- (B) communicating thermal energy from the object through the pins to a thermal spreader forming a plurality of gaps with the plurality of pins, *the step of biasing comprising utilizing a spring element formed of thermally conductive material with a substantially planar face, each of the pin heads being substantially flush with the face.*

Again, Chu '281 has no such spring element and thus fails under 35 U.S.C. §102(b). We refer again to item 36 of Chu '281, which is not flush to the heads of pin-pistons 24.

Claims 23, 24 are amended to depend from claim 18 and thus benefit from like arguments.

Reconsideration of claims 2, 13, 14, 18, 23, 24 is requested.

Claims 12, 14 and 24 stand rejected under 35 US §102(b) as being anticipated by US Patent No. 5,097,385 granted to Chao-Fan Chu et al.(hereinafter, "Chu '385"). We respectfully disagree.

Independent claim 12 provides a thermal transfer interface with the following elements (*with emphasis*):

- (A) a thermal spreader forming a plurality of passageways;
- (B) a spring element coupled with the spreader; and
- (C) a plurality of thermally conductive pins for the passageways, each of the pins having a head and a shaft moving with the spring element, at least part of the shaft being internal to the passageway and forming a gap with an internal surface of the passageway, wherein the pin heads collectively and macroscopically conform to an object coupled thereto to transfer heat from the object to the spreader through the passageway gap formed between the spreader and each of the plurality of pins, *the pin heads arranged in a geometric pattern that covers an area extending beyond a region of contact between the pin heads and the object.*

We disagree with the Examiner's assessment of Chu '385. A chip 204 is shown in Chu '385; however the pistons 210, 212 do not extend beyond chip 204. See, e.g., FIG. 1 of Chu '385. Continuing with other figures of Chu '385: FIGs. 3 and 4 shows chip 204 confined to the edges, but within a physical extent of, pistons 210, 212, 204, 216. FIGs. 8 and 9 of Chu '385 show similar configurations.

On the other hand, with review of FIG. 1 and FIG. 2 of the present specification, pins 12 clearly extend beyond a physical extent of object 14 (e.g., a die); this permits, for example, misalignment between the pins and the die without reduction in thermal transfer efficiency due to misalignment with a particular pin.

Chu '385 thus fails to anticipate claim 12 under 35 U.S.C. §102(b).

Claim 14 is amended to also depend from claim 12 (and claim 2), thus benefiting from like arguments.

Claim 24 depends from independent claim 8, argued above.

Reconsideration of claims 12, 14, 24 is requested.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claim 18 stand rejected as being unpatentable over Chu '281 in view of U.S. Patent No. 5,920,457 ("Lamb"). Respectfully we disagree because, among other reasons, Chu and Lamb do not render claim 18 *prima facie* obvious. According to the MPEP, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine reference teachings (emphasis added). Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Our arguments above show that Chu '281 does not anticipate claim 18; thus Chu '281 does not teach each of the elements of claim 18. Lamb also does not teach or suggest pins that are *flush with the face of the spring*. Thus the combination of Chu '281 and Lamb do not render claim 18 obvious; reconsideration is requested.

Claims 11 and 22 stand rejected as being unpatentable over Chu '281 in view of U.S. Patent No. 5,394,299 ("Chu '299"). Claims 11 and 22 are amended to depend from independent claims 2, 12 or 18, argued above, thus benefiting from like arguments. Reconsideration is requested.

Claims 5, 10 and 21 stand rejected as being unpatentable over U.S. Patent No. 4,226,281 ("Chu") in view of U.S. Patent No. 4,153,107 ("Antonetti"). Claims 5, 10 and 21 are amended to depend from independent claims 2, 12 or 18, argued above, thereby benefiting from like arguments. Reconsideration is requested.

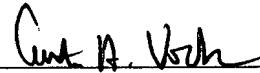
Conclusion

In view of the above Remarks, Applicant has addressed all issues raised in the Office Action dated January 26, 2005, and respectfully solicits a Notice of Allowance for all claims 2, 5, 10-14, 18, 21-24. Should any issues remain, the Examiner is encouraged to telephone the undersigned attorney.

Applicants hereby authorize the required \$360 fee for multiple dependent claims and \$200 fee for one additional independent claim be charged to Deposit Account No. 08-2025. It is believed that no further fees are due in connection with this amendment. If any additional fee is due, please charge Deposit Account No. 08-2025.

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By



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